

# LST200

## Ultrasonic level transmitter



LST200  
Ultrasonic level  
transmitter

The easy choice for intelligent  
level measurement

**Measurement made easy**

### For more information

Further publications for LST200 are available for  
free download from:  
<https://new.abb.com/products/measurement-products/zh/lst200-language>



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Sales



Service



# 1 Safety

## General information and notes

Read these instructions carefully prior to installing and commissioning the device .

These instructions are an important part of the product and must be kept for future reference .

These instructions are intended as an overview and do not contain detailed information about all design variations of this product or every possible aspect of installation, operation and maintenance .

For additional information, or if specific problems occur that are not detailed in these instructions, contact the manufacturer .

The content of these instructions is neither part of any previous or existing agreement, promise or legal relationship, nor is it intended to change the same .

This product is designed with state-of-the-art technology and is operationally safe . It left the factory pre-tested for safety and in perfect working order . The information in this manual must be observed and followed in order to maintain safe and optimal function throughout the period of operation .

Modifications and repairs to the product may be performed only if expressly permitted by these instructions or ABB technical support .

Observe all of the instructions and the safety and warning symbols to ensure optimum protection of personnel and the environment, as well as safe and fault-free operation of the device .

Information and symbols on the product must be observed . They may not be removed and must be fully legible at all times .

## Intended use

This device is intended for the following uses:

- To measure distance to a liquid surface (directly, using time-of-flight through air)
- To measure the level of liquids in tanks (indirectly, using distance measurement and tank dimensions)
- To measure volumetric flow (indirectly using distance measurement and tank dimensions)
- To measure the volume (indirectly using distance measurement and tank dimensions)

Using these products as intended involves observing the following points:

- Reading and following the instructions in this manual
- Observing the technical ratings (refer to datasheet)

## Intended use

The following are instances of improper use of the device:

- Measuring the level of bulk solids
- Measuring in a medium other than air, for example in the presence of heavy gas vapors
- Use as a climbing aid, for example for mounting purposes
- Use as a support for external loads, for example to support the tank, etc
- Addition of material, for example by painting over the name plate or welding/soldering on parts
- Removal of material, for example by spot drilling the housing

## Target groups and qualifications

Installation, commissioning and maintenance of the product may be performed only by trained specialist personnel who have been authorized by the plant operator to do so. The specialist personnel must have read and understood the manual and comply with its instructions.

The operators must strictly observe the applicable national regulations with regard to installation, function tests, repairs, and maintenance of electrical products .

## Warranty provisions

Using the device in a manner that does not fall within the scope of its intended use; disregarding this manual; using under-qualified personnel; or making unauthorized alterations releases the manufacturer from liability for any resulting damage and will render the manufacturer's warranty null and void.

## Operator liability

Installation, operation, maintenance and servicing must only be carried out by suitably trained personnel and in accordance with the information given . Any deviation from these instructions will transfer the complete liability to the user .

## Information on WEEE2 Directive (Waste Electrical and Electronic Equipment)

This product/solution is not subject to the WEEE2 Directive or corresponding national laws (e.g., the ElektroG-Electrical and Electronic Equipment Act-Germany). Dispose of the product/solution at a specialized recycling facility. Municipal garbage collection points should not be used for this purpose. According to the WEEE2 Directive, only products that are used in private applications may be disposed of at municipal garbage facilities. Proper disposal prevents negative effects on both individuals and the environment and also supports the reuse of valuable raw materials. ABB can accept and dispose of returns for a fee.



## Cybersecurity

This product is designed to be connected to and communicate information and data via a digital communication network interface. It is the user's sole responsibility to provide and continuously ensure a secure connection between the product and the user's network or any other network (as the case may be). Users shall establish and maintain any and all appropriate measures (such as, but not limited to, the installation of firewalls, the application of authentication measures, the encryption of data, the installation of anti-virus programs, etc.) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized accesses, interferences, intrusions, leakages and/or theft of data or information. ABB and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB strives to maintain cybersecurity for its products and services. By visiting the web page indicated below, you will find notifications about newly found software vulnerabilities and options to download the latest software. It is recommended that you visit this web page regularly:

<http://new.abb.com/about/technology/cyber-security>

## Plates and symbols

Safety, warning and note symbols

### ⚠ DANGER

The signal word '**DANGER**' indicates an imminent danger. Failure to observe this information will result in death or severe injury.

### ⚠ WARNING

The signal word '**WARNING**' indicates an imminent danger. Failure to observe this information may result in death or severe injury.

### ⚠ CAUTION

The signal word '**CAUTION**' indicates an imminent danger. Failure to observe this information may result in minor or moderate injury.

### NOTICE

The signal word '**NOTICE**' indicates potential material damage.

### Note

'**Note**' indicates useful or important information about the product.

**NOTE**

The name plates shown here are only examples.

The name plates attached to the device may be different to what you see here.

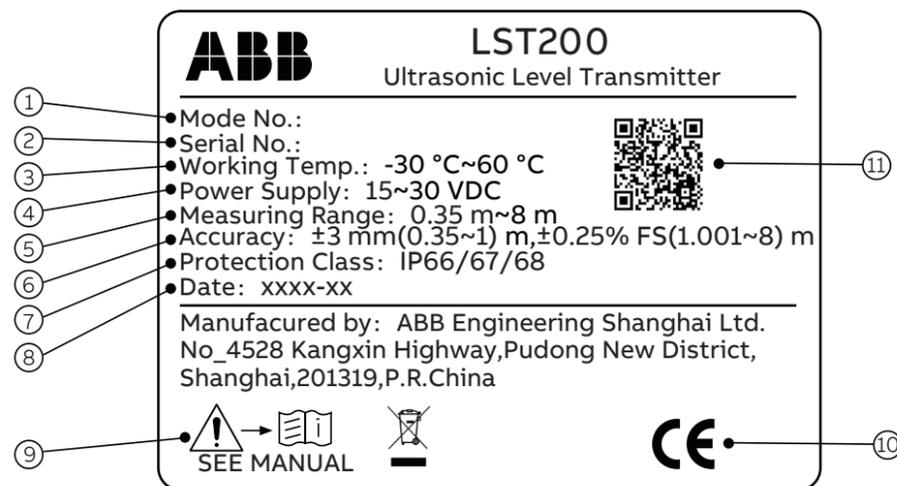


Figure 1 Product labels for LST200

- ① Model number
- ② Serial number for identification by the manufacturer
- ③ Working temperature
- ④ Power supply
- ⑤ Measuring range
- ⑥ Accuracy
- ⑦ Protection type according to EN 60529
- ⑧ Year / Month of manufacture
- ⑨ Alarm sign (read the instruction before using it)
- ⑩ CE mark
- ⑪ QR code linked to more LST200 instructions

**2 Introduction****Basic principles of LST200 measurement**

The LST200 is a microprocessor-based ultrasonic level transmitter that transmits ultrasonic pulses the direction of the product surface. When some of the energy is reflected and travels back towards the sensor, by measuring the time (t) elapsed between the initial pulse and the reflected one, the electronics can calculate the distance (D).

$$D = v \times t / 2$$

v is the velocity of the sound which would be affected by the intrinsic property of transmitting media and temperature. The temperature compensation function is introduced to ensure the measuring stability.

Using the empty distance (E, enter by user), the device will calculate the product level (L) accordingly:

$$L = E - D$$

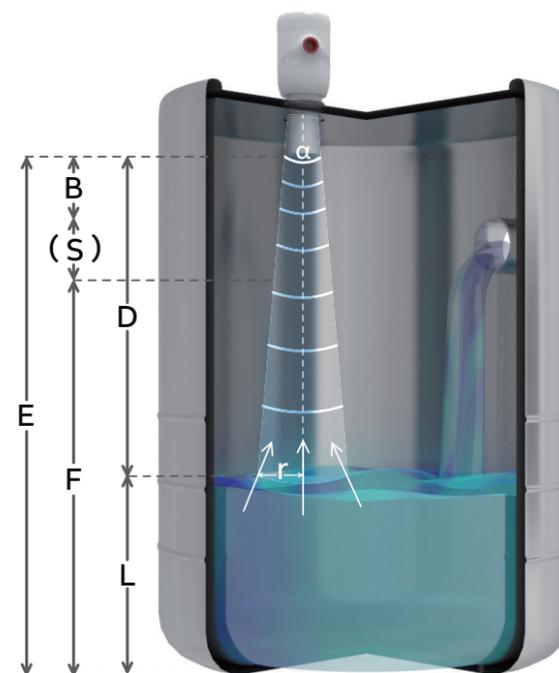


Figure 2: Ultrasonic measurement principle

**About this guide**

This user guide is intended for personnel using LST200 instruments for routine monitoring. It contains installation, usage, maintenance, and troubleshooting instructions. Read this guide carefully before working with the instrument. For personnel and system safety, and for optimum performance, make sure that you thoroughly understand the contents of this document before installing, using or maintaining the instrument. This guide does not contain detailed information on all available models or every conceivable event that may occur during setup, operation, and maintenance work.

**First look**

Below is a first look at the main components of the LST200 instrument:

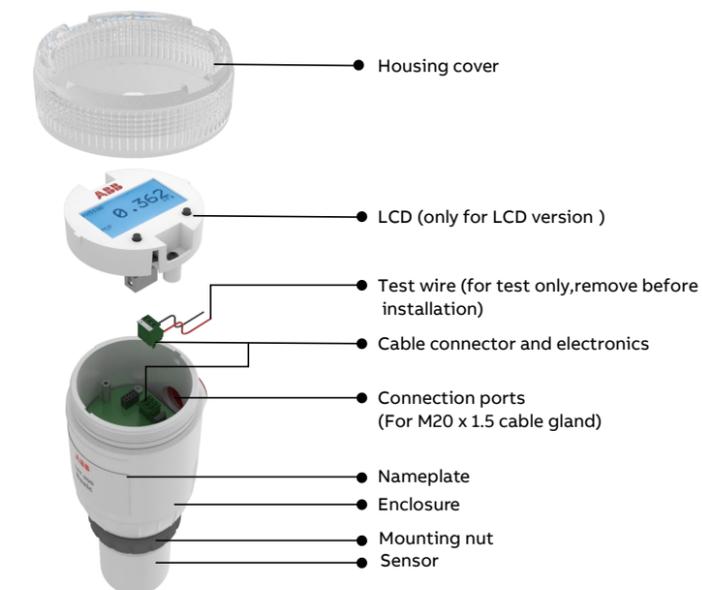


Figure 3: Main components of LST200

## As shipped

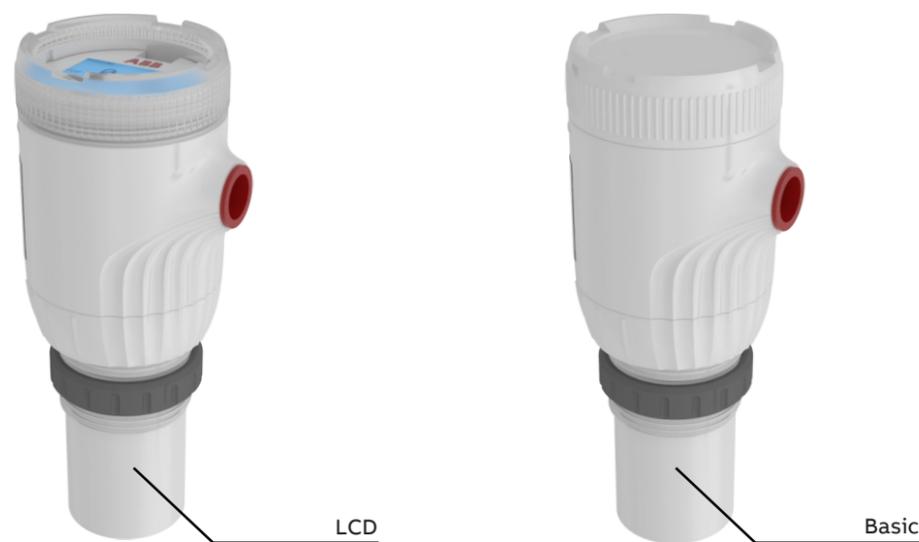


Figure 4: Basic (without LCD) and LCD version

### Basic installation procedure

Here are the basic installation steps described in this guide. The following chapters provide more details.

1. Access and properly secure the installation site (provide protection against chemicals, mains power down, etc.).
2. Mount LST200 on flanges of brackets.
3. Connect LST200 to the mains.
4. Power up and configure the instrument (configuration can also be done before mounting for demanding sites).

### Intended use

The instrument is designed for use exclusively within the values stated on the name plates and within the technical limit values specified on the data sheet.

Technical limit values that must be observed at all time are:

- The maximum working pressure and temperature may not be exceeded
- The electrical specifications must be observed
- The enclosure material's compatibility with the process must be evaluated

ABB will gladly support you in evaluating the application but cannot accept any liability in doing so. Operators must strictly observe the locally applicable national regulations with regard to installation, function tests, repairs, and maintenance of electrical devices.

## 3 Mounting the LST200

The following pages explain how to proceed with a typical physical installation of your LST200 instrument. Keep in mind that there are numerous possible installation scenarios; this documentation cannot cover them all. However, all efforts have been made to properly indicate the main challenges associated with such an installation.

### Safety first

#### ⚠ WARNING

For personnel and system safety, and to ensure optimum performance, make sure that you thoroughly understand the content of this guide, and especially the Safety chapter, before installing, using and maintaining the instrument. Carefully plan any installation, modification or repair before actually proceeding.

### General installation requirements

When installing the LST200 level transmitter in your application, the following guidelines should be considered.

Ensure the instrument is installed within recommended temperature (-30 to 60 °C (-22 to 140 °F)) and pressure (-4 to 44 psi (-0.25 to 3.0 bar)) ratings.

- Supply voltage at the instrument terminals must be between 15–30 VDC for basic version and 19–30 VDC for LCD version
- The sensor must be installed as perpendicularly as possible to the surface being measured
- Avoid installing the instrument in a location where vibration may be present during operation
- Mount with a clear line-of-sight to the target surface
- If installed in a cylindrically shaped vessel, ensure that the sensor is installed just above the lowest point in the tank. This allows measurements to be taken as the tank approaches empty
- Use the mounting kit to raise the instrument above the highest point in the tank
- Close the unit after wiring with proper cable gland (M20 x 1.5 threaded entry) in order to maintain IP66/IP67/IP68 ingress protection

#### ⚠ CAUTION

Cables, cable glands must comply with the degree of protection IP66/IP67/IP68.

It is the costumers' responsibility to use appropriate cable glands, lubes and/or sealants for the cable entry ports. ABB does not assume any responsibility for cable glands or adapters that do not meet the above requirements. The installer assumes responsibility for any other type of sealing medium used.

For more details, please refer to the datasheet and mounting details below in this chapter.

### Gathering the necessary tools

To proceed with the installation of an LST200 instrument, you may need some basic tools such as:

- The M2.5 flat head screwdriver for the power wire connector screws
- The screwdriver for HMI cross screw M3
- Configuration interface cable if you need to configure the device using a PC through the ABB FIM tool with FDI package (see page 22 of this guide for order code)
- Safety footwear and goggles
- Protective gloves
- ESD protection equipment

### Accessing the location

#### ⚠ DANGER

The installation area must be secured. If necessary, tape off all limits of approach to the installation area and ensure that all personnel understands the risks associated with the installation procedure.

#### ⚠ WARNING

Only qualified and authorized personnel should be put in charge of the installation, electrical connection, commissioning, operation, and maintenance of the instrument. These personnel must hold the necessary qualifications and authorizations, such as training or instruction, to operate and maintain devices or systems in accordance with safety engineering standards regarding electrical circuits, aggressive media, and adequate safety systems, based on local and national safety standards, i.e., building codes, electrical codes, etc.

**⚠ WARNING**

The instrument can be operated with aggressive media. As a result, serious injury or significant property damage may occur if this device is operated incorrectly.

Any process media released may cause severe injuries.

Provide adequate protection and training against all chemicals involved in the work environment.

**⚠ CAUTION**

Prior to using the instrument, material safety data sheets (MSDS) of all products being monitored must be available at all times for users' safety.

**Dimensions**

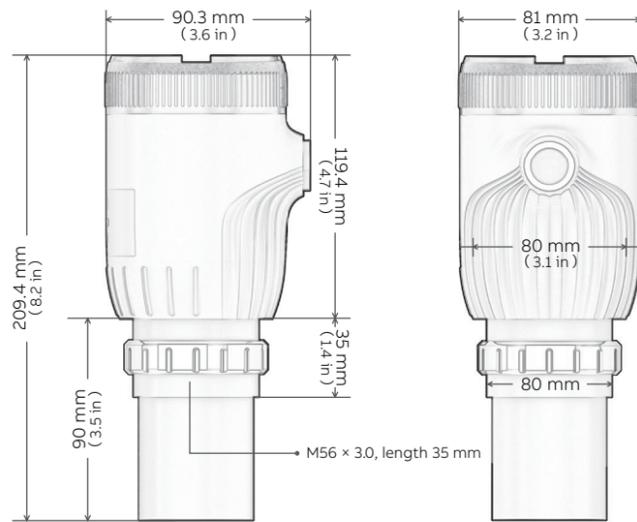
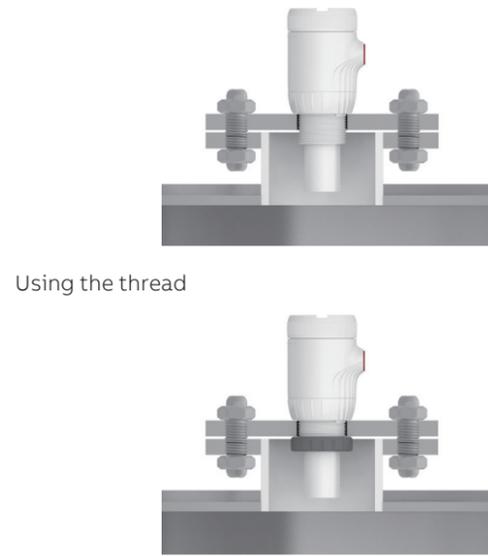


Figure 5: Dimensions

**Installation**

The LST200 transmitter can be mounted directly on a tank/ flange using either a nut or a sleeve.



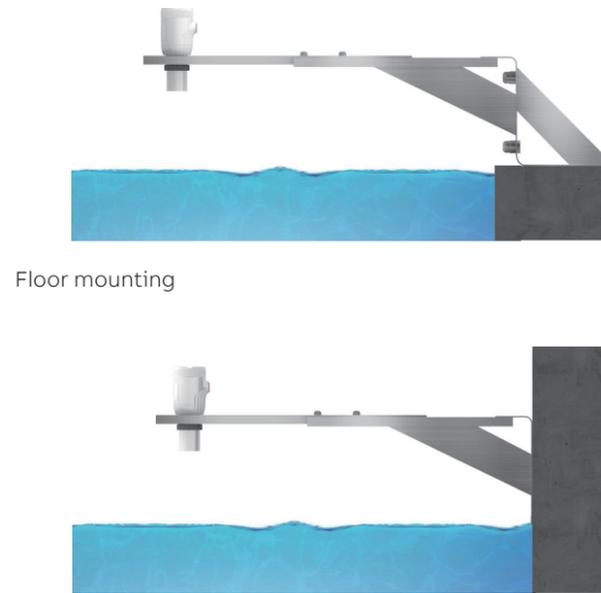
Using the thread

Using the nut

Figure 6: Direct mounting variations

**Mounting with bracket**

For open channel or basin, a mounting bracket may be needed, (Order code see page 22)



Floor mounting

Wall mounting

Figure 7: Mounting with bracket

**Typical level measurements installation**

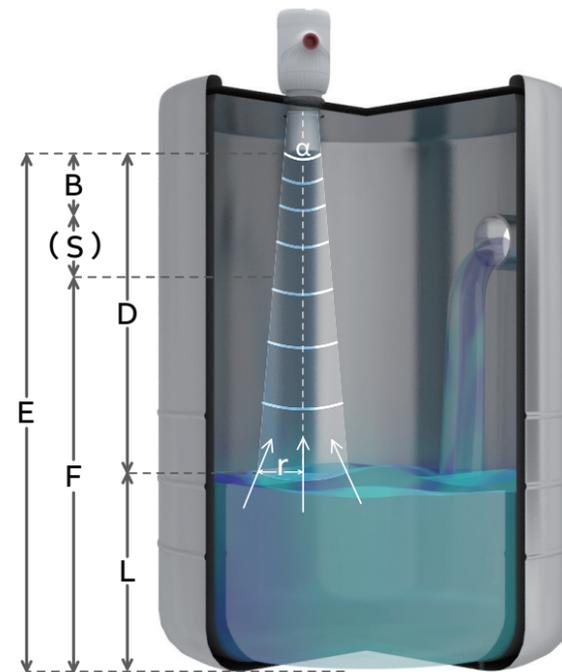


Figure 8: Typical installation and key parameters

<b>B</b>	Blanking area	Should be set $\geq 350$ mm, signals within this area would be ignored
<b>D</b>	Distance	Distance from sensor surface
<b>E</b>	Empty distance	Max. 8 m, set according to the distance from tank bottom to sensor
<b>L</b>	Level	Level from tank bottom (defined by empty distance) sensor
<b>F</b>	Full range (Span)	Set according to the user's 100% output point. Leaving a safety distance 'S' from blanking area is suggested.
<b><math>\alpha</math></b>	Emitting angle $10^\circ$	Detection range reference - avoid obstructions (filling water, switches, weld seam) in this range. Reference for best performance; distance from the tank bottom to the sensor: D=8 m, r=694 mm D=6 m, r=519 mm D=5 m, r=431 mm D=4 m, r=344 mm D=2 m, r=169 mm D=1 m, r=81 mm

**Nozzle installation**

For easier installation or keeping a safety distance "S" between the blanking area and upper range limits (URV), you may need the help of a pipe nozzle to install the instrument at a certain height. The interior of the nozzle must be smooth without burrs or joints and a 45-degree angle edge would be ideal to minimize the disturbance. The limits of the nozzle are as below:

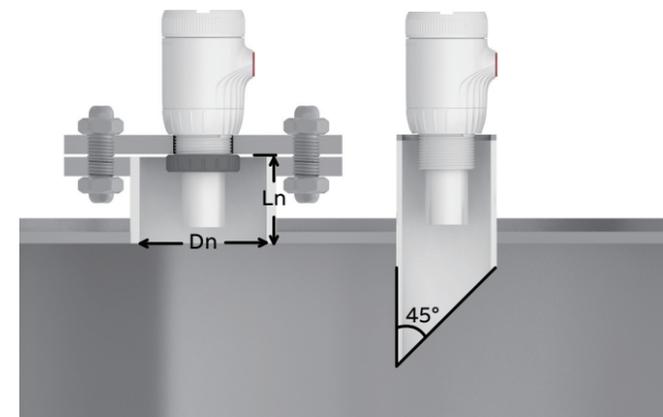


Figure 9: Nozzle installation

Nozzle dimension (Dn)	Max. length (Ln mm)
DN80 /3"	180
DN100 /4"	225
DN150 /6"	345
DN200 /8"	450
DN250 /10"	800
DN300 /12"	1500

## To avoid false echoes

A PE or PVC pipe may be needed to guide the ultrasound when the false echoes from the obstacles were strong, and the recommended pipe inner diameter is no less than 150 mm (300 mm if there are joints for longer pipe).

Note: A vent is needed on the upper side of the pipe.

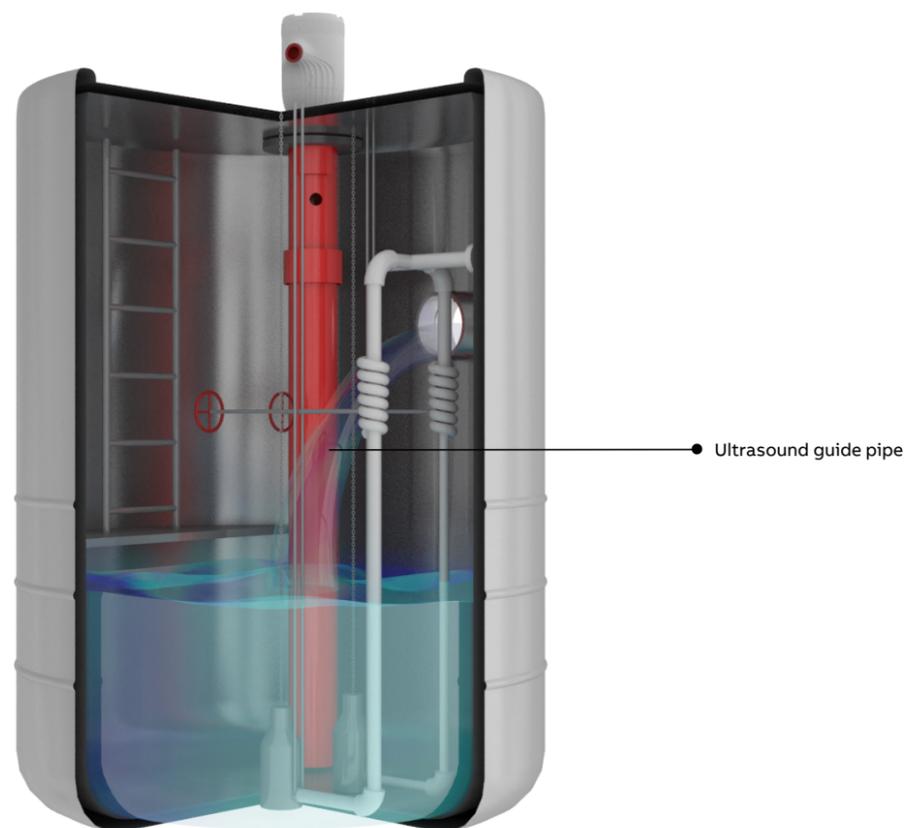


Figure 10: Ultrasound guide pipe installation

## 4 Electrical connections

### Before installation

- Ensure the LST200 is not plugged in to any power supply
- Installation engineers must statically discharge themselves or use a wrist strap before connecting cables to the LST200
- Check the LST200 power supply to ensure that it does not exceed the permitted range
- When the terminal cover of the LST200 is open, protect the inside of the transmitter against the ingress of dust and moisture

#### ⚠ WARNING

All connections must be established in a de-energized state. Before working on the circuit, secure the breaker to prevent any accidental power-up.

#### NOTICE

Electronic components are sensitive to electrostatic discharges.

Before performing any connection, operators shall make sure that they have discharged all static electricity from their body before touching electronic components.

### Typical LST200 connection

The LST200 is a two-wire loop-powered device that can be connected directly with a DCS or PLC. Setup can be performed either through the LCD display or on a PC or laptop.

#### ⚠ WARNING

The HART protocol is an unsecured protocol. The intended application should be assessed to ensure that the protocol being used is suitable before implementation.

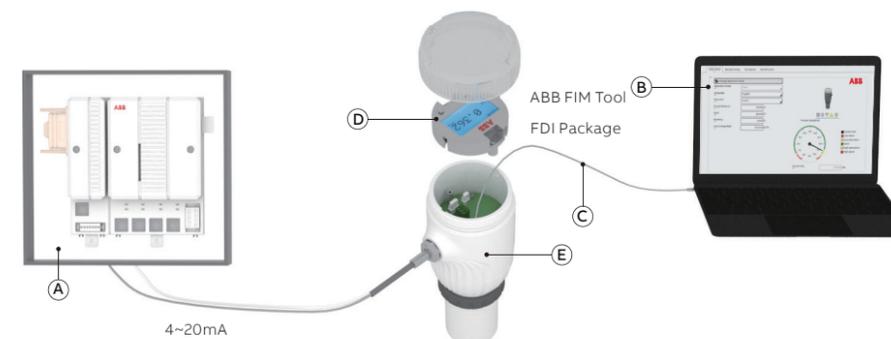


Figure 11: Typical connection

- (A) DCS or PLC
- (B) Computer with configuration software (through ABB FIM tool with FDI package)
- (C) Interface cable (specially designed for LST200, see order code in page 22)
- (D) LCD
- (E) LST200

## To connect the LST200 instrument

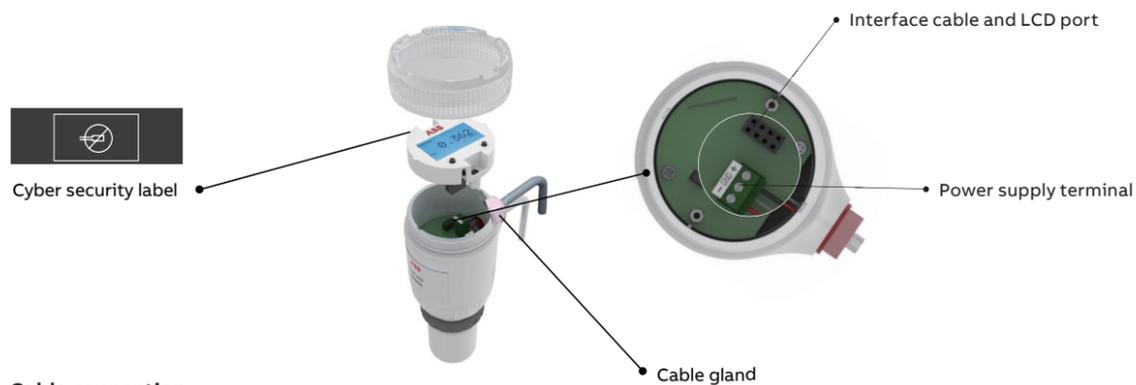


Figure 12: Cable connection

### NOTICE

After an interval of several weeks, increased force will be required to remove the housing cover. This situation is normal and is caused by the type of gasket used.

After power-on, there would be 50 seconds or less before LST200 fully started.

Wire the transmitter as follows:

1. Remove the temporary plastic cap from the electrical connection port
2. Remove the housing cover and the LCD (for LCD option)
3. Remove the green terminal with + - mark
4. Route the connection cable through the cable gland and the electrical connection port
5. Connect the positive lead to the + terminal, and the negative lead to the – terminals. Connect the shielding layer to GND if possible
6. Reconnect the green terminal
7. For LCD version, put back the LCD and paste the cyber security label to cover one of the LCD screws
8. Put back the housing cover. Turn it so as to seat the O-ring into the housing, then continue tightening by hand until the cover contacts the housing
9. Power up the instrument by switching on the circuit breaker

## 5 Configuring the instrument

Once the LST200 instrument is physically installed and properly powered, you might need to configure the various parameters to better suit your needs if they go beyond the default configuration.

Your LST200 instrument comes configured with certain default parameters (default empty distance: 8 m, span: 7.65 m), but you still need to select certain options and set specific values for your instrument to work as you expect.

After start-up, the indicator shows the current PV value and percentage. You can push the right button to enter the main menu and the left button for diagnostic information if errors existed. In the Main menu, use the left button for scrolling and the right button for entering values.

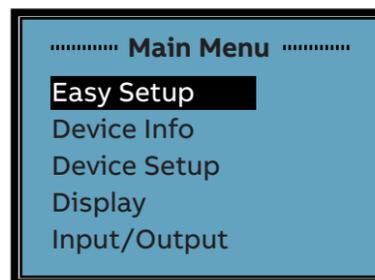


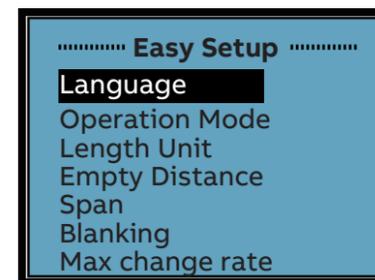
Figure 13: LCD and menu

## Configuring using the Easy Setup menu

The most common configuration parameters are summarized in the Easy Setup menu. This menu provides the quickest way to configure the device.

Tips:

- After you set the empty distance and span, the 0% (4 mA point) and 100% (20 mA point) will link to 0mm (bottom of the tank) and the span value you entered. If you want to change the mapping, go to the “Input/Output” menu.
- Max change rate can help you ignore the sudden level change (like damping). This could be used when unexpected obstacles and noise randomly occur. Be careful that the real change might be ignored if the value was set too small. Disable this function by setting the value to ‘0’.
- For your reference: Very Slow: <1 cm/min , Slow: <5 cm/min, Medium: <25 cm/min , Fast: 1 m/min , Very Fast: <5 m/min.



Language	English, Chinese
Operation Mode	Level Mode, Flow Mode, Volume Mode, Distance Mode
Length Unit	m, cm, mm, feet, inch
Empty Distance	0 to 9600 mm
Span	2 mm to (Empty Distance-Blanking)
Blanking	350 mm to (Empty Distance-Span)
Max change rate	0 to 720 m/h

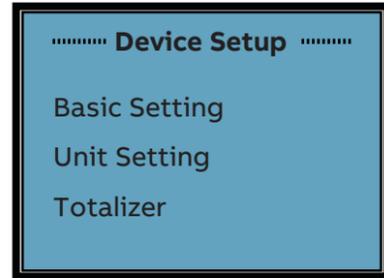
## Further configuration

The following shows the main function that can help you further configure your LST200 instrument.



**Device:** Product Code, Serial No., Calibration Date, Calibration Location, Manufacturer, Street, City, Phone

**Device Version:** Firmware Version, HW Version, Boot Version



**Basic Setting**

Operation Mode	Level Mode, Flow Mode, Volume Mode
Empty Distance	0 to 9600 mm
Span	2 mm to (Empty Distance – Blanking)
Blanking	350 mm to (Empty Distance – Span)
Max change rate	0 to 720 m/h
Max Power Level	1 to 5
Min Power Level	1 to 5
Reset to Factory Default	-

Changing the Max and Min Power level is not recommended because the LST200 can smartly increase or decrease the strength of the ultrasound power depending on the strength of the echo. Setting a proper power level can further ensure a stable output when the echo is not stable due to disturbance like strong turbulence or vapor.

**Unit Setting**

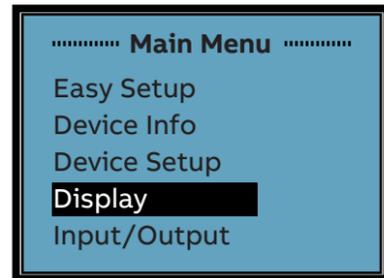
Length Unit	m, cm,mm,feet,inch yard
Flow Unit	m3/s, m3/min, m3/h, m3/d/ft3/s, ft3/min, ft3/h, ft3/d,L/s, L/min, L/h,USGps, USGpm, USGph,USGpd UKGps, UKGpm,UKGph UKGpd, MILGpd
Totalizer Unit	m3, ft3, L, USG, UKG
Volume Unit	t3, L, USG, UKG
Temperature Unit	Kelvin, Celsius, F
Change Rate Unit	m/s, m/h,inch/min,feet/min

**Totalizer**

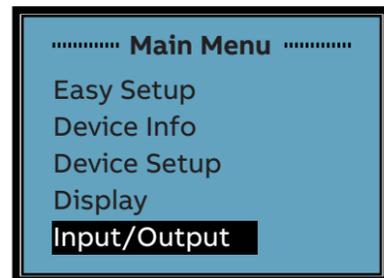
Interval Overflow Num	Read Only
Interval Totalizer	Read Only
Overall Overflow Num	Read Only
Overall Totalizer	Read Only
Overflow Threshold	10 E+9,10 E+8,0 E+7,10 E+6,10 E+5
Reset Interval Totalizer	
Enable Totalizer	

**Note:**

A flow totalizer is a running total of how much liquid has passed by the sensor within a given time. To enable totalizer function, the first step is to enable the flow function.



Language	English, Chinese
Backlight Mode	Dynamic, always On

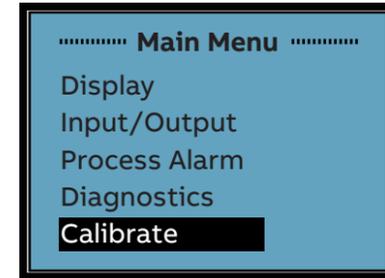


Link the 4mA (0%) and 20mA (100%) to specific value. By default, 4mA is linked to 0mm and 20mA is linked to span value.

Distance I=100%	350 to 11000 mm
Distance I=0%	350 to 11000 mm
Level I=100%	350 to 11000 mm
Level I=0%	350 to 11000 mm
Flow I=100%	0 to 9999990000.0 m3/h
Flow I=0%	0 to 9999990000.0 m3/h
Volume I=100%	0 to 9999990000.0 m3
Volume I=0%	0 to 9999990000.0 m3

**Setting calibration parameters**

Should configuration not be enough to meet your needs, you will have to calibrate your instrument and enter specific values to perform this calibration. The following pages explain how to do this.



There are 4 options you can choose for calibration:

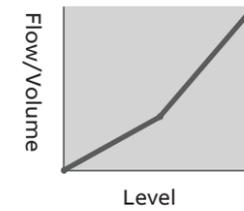
- Temp. Compensation: Enabled by default and you can read the temperature through 'Sensor Temperature' menu
- Dry: You can match the sensor point to expected output without checking the actual level

Calibration / Dry	Value range	Description
Lower Sensor Point	0 to 11000 mm	Lower sensor point for level calibration
Upper Sensor Point	0 to 11000 mm	Upper sensor point for level calibration
Lower Level Point	0 to 11000 mm	Lower level point for level calibration
Upper Level Point	0 to 11000 mm	Upper level point for level calibration

- Wet: You can match the sensor point to expected output when the LST200 measures the actual level

Calibration / Wet	Value range	Description
Lower Sensor Point	Ready only	Result lower sensor point for level calibration
Upper Sensor Point	Ready only	Result upper sensor point for level calibration
Lower Level Point	0 to 11000 mm	Lower level point for level calibration
Upper Level Point	0 to 11000 mm	Upper level point for level calibration
Wet Calibrate Lower		Wet calibrate lower sensor point
Wet Calibrate Upper		Wet calibrate upper sensor point

- Linearization table: By setting up a linearization table, mapping the relationship between Level and Volume/Flow in advance, the volume or flow can be calculated according to the level value.  
Note: the table should be filled in an increasing trend



Linearization	Value range	Description
Active Table	Disable, Enable	Enable or disable the linearization table
Max Flow	0 to 9999990000.0 m <sup>3</sup> /h	The maximum flow value of the channel
Max Volume	0 to 9999990000.0 m <sup>3</sup>	The maximum volume of the vessel
Linearization Size	2 to 32	The number of points to be used for the Linearization
Linearization Table	-	Linearization Table configuration interface

**Maintenance and troubleshooting**

No user/operator adjustments inside LST200 instruments are necessary or recommended by ABB. Service tasks that are not explained in this documentation are to be performed at the factory by qualified service personnel only.

Contact ABB for any additional information, or in the event of specific problems not covered in this user guide.

If the LST200 instrument is malfunctioning in any way, the LCD displays specific event messages designed to help you identify and understand the situation.

When an event happens, a message consisting of an icon and text appears at the bottom of the LCD.

This short message gives you a quick indication of the nature of the situation at hand. The text beside the icon provides information about the potential source of the problem.

All these text messages are saved in a diagnostic history. You can browse through this diagnostics history and clear this history when all events have been accounted for.

Below is a list of the event codes that your LST instrument might display, should a problem arise. The first letter of the code refers to NAMUR codes:

- F: Failures
- S: Function check
- C: Out of specifications
- M: Maintenance request



Error no. / Range	Text on the LCD display	Cause	Remedy / Spare part
F200.004 Process	Primary variable exceeds limit	Primary variable exceeds limit	Confirm the process variable and take action for limit exceeding
M011.031 Operation	Incorrect Sensor Charge Voltage	The charger voltage is not enough to drive the sensor	Restart the device. If the condition persists contact service for a replacement
M010.032 Operation	Incorrect voltage for device	Incorrect voltage for proper device operation	Check power supply
S082.033 Process	Amb. Temp Out of Range	Environmental conditions exceed acceptable device operating conditions	Check ambient temperature
S081.034 Process	Sensor temperature exceed	Sensor conditions exceed acceptable device operating conditions	Check sensor temperature
S020.035 Process	Primary Variable exceeds range	Primary variable exceeds range	Confirm Primary Variable and take action for range exceeding
C150.036 Configuration	Data Simulation Warning	One or more measurement values are in simulation mode	Confirm measurement values should be in simulation mode
C151.037 Configuration	Alarm Simulation Warning	Alarms are in simulation mode	Confirm alarm should be in simulation mode
F221.039 Electronics	Primary Current Uncertain	Calibration data is not correct	Contact the ABB service to format the EEPROM
F223.040 Electronics	Electronics ROM Failure	Program memory test failed	Restart the device. If the condition persists contact service for a replacement
F222.041 Electronics	Electronics ROM Failure	Electronics memory test failed	Restart the device. If the condition persists contact service for a replacement
C160.042 Electronics	NV Data Write Error	Electronics EEPROM memory is corrupted	Restart the device. If the condition persists contact service for a replacement
S080.043 Process	Current is in saturation level	Current saturated high or low	Check process conditions and/or device configuration
M051.044 Electronics	External Flash Error	Electronics flash memory is corrupted	The electronics must be replaced
F225.045 Electronics	NV Data illegal	Data in Electronics EEPROM memory is out of the range	Contact the ABB service to format the EEPROM
F220.046 Electronics	NV Data Not Integrate	Data in Electronics EEPROM memory is not integrate	Contact the ABB service to format the EEPROM
F230.047 Sensor	Sensor Signal Lost	No echo detected from the sensor	Check Process

## Diagnosing from a waveform

Most echo-related problems can also be diagnosed with the help of the integrated waveform display.

Waveform management is performed from the Diagnostics menu.

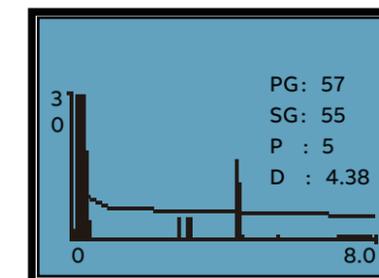
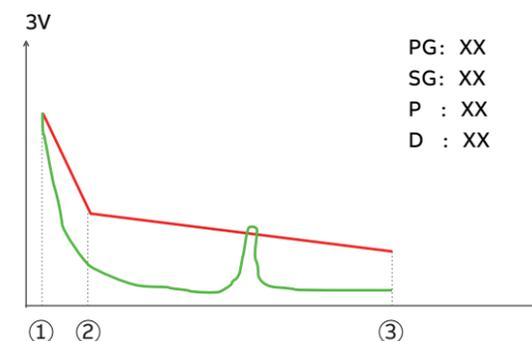


Figure 14: Waveform introduction

- ① Blanking/Threshold Start
- ② Threshold Middle
- ③ Empty/Threshold End

### NOTE:

- Any echo before the blanking should be disregarded as it will be ignored by the transmitter
- Red line is the threshold (3 threshold points can be adjusted by user in Echo Threshold menu). Green line is the Echo waveform
- If Green line is beyond the threshold, the position in X axis is the instant distance, which is also displayed at D: xx
- PG, SG are the values of the two-level gains to driver the sensor
- P is the power level to drive the sensor
- PG, SG and P will be automatically adjusted by the algorithm according to operating conditions and this is called "GAP technology" that will ensure the instrument always works at its best condition with proper signal strength



## 7 Spare parts and accessories

Ordering code	Description
3KXL065041U0100	Small L-shape bracket assembly,wall mounted(350 mm)
3KXL065041U0200	Extendable bracket assembly,wall mounted(547~732 mm)
3KXL065041U0400	Small L-shape bracket assembly,floor mounted(350 mm)
3KXL065048U0300	Extendable bracket assembly,floor mounted(547~732 mm)
3KXL065057U0100	Anti-water pad for heavy condensation application
3KXL065068U1800	LCD (For configuring LST200 if you choose No LCD option or as spare part)
3KXL065113U0100	Interface cable for configuring LST200 with computer

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